

TEMPORAL CHANGES IN PRESENCE OF LATE INSTAR
MITOURA SPINETORUM (LYCAENIDAE) IN EASTERN OREGON

Additional key words: mistletoe, mimicry.

The thicket hairstreak, *Mitoura spinetorum* (Hewitson), feeds on several species of dwarf mistletoe plants, e.g. *Arceuthobium campylopodum* Englem. (Loranthaceae), which parasitize *Pinus ponderosa* Dougl. ex. Laws. (Pinaceae) (Shields 1965). Ballmer and Pratt (1992) proposed the genus *Loranthomitoura* to accommodate this species and four other North American hairstreak butterflies which utilize *Arceuthobium* as larval hosts, based on characteristics of immature stages, especially first instar chaetotaxy.

Mitoura spinetorum is distributed from Mexico to British Columbia (Shields 1965) and is recognized as a potential control agent for damaging mistletoe infections (Stevens & Hawksworth 1970). This insect produces at least two broods annually (Shields 1965, Pyle 1981), with adults flying from March to September in California and Oregon. Individual eggs are placed directly on the aerial shoots of the mistletoe plants, and the small yellowish olive larvae are well hidden amongst the masses of the host plant shoots.

We assessed the relative abundance and field periodicity of this species at Starkey Experimental Forest near Ukiah, Umatilla Co., Oregon, in 1992. In this area, ponderosa pine occurs mostly as small stands of open-grown trees, with branches extending nearly to the ground. Mistletoe plants were abundant on the lower branches of some trees, and numerous others could be seen on higher branches within the tree crowns.

In May 1992, three groups of 100 mistletoe plants each were marked with plastic flagging and numbered aluminum tags on the lower branches of selected ponderosa pines. To better represent the mistletoe plant population in an area, we marked only five plants per tree, each on a separate branch and usually on different sides of the host tree. Marked plant groups were separated by about 0.75 km.

At 8-10 day intervals through June and July, each mistletoe plant was carefully inspected to detect and record the presence of *M. spinetorum* larvae. Notes were kept on the location and developmental stage (relative size) of each larva found. Late-instar *M. spinetorum* are sluglike in shape and move slowly and infrequently; they often can be found feeding on the same or an adjacent mistletoe shoot for several days. Larvae in early stages are difficult to see under field conditions because mistletoe plants typically consist of dense clusters of aerial shoots and the *M. spinetorum* larval shape and coloration closely mimic the food plant (Remington 1958, Stevens & Hawksworth 1970, Ballmer & Pratt 1988). McCorkle (1962) states that the early instars of *M. johnsoni* Skinner feed by inserting their head into a hole chewed at the base of a scale on a mistletoe stalk. The cryptic and sedentary feeding habits of *M. spinetorum* apparently caused us to overlook younger larvae feeding deep in the masses of food plants. Accurate determination of all larvae present at any given time would require destructive sampling and careful dissection of the mistletoe plants. Because we did not want to destroy the marked mistletoe plants, most of the larvae we found were in the mid- to late-instars (usually 10-12 mm or longer) but, once recorded, could be relocated for a few days until they apparently were fully developed (approximately 18-20 mm long) and ready to pupate. Only a few of them persisted in larval form from one scheduled inspection time to the next.

No *M. spinetorum* larvae were found on marked plants until June 10, when two, each about 18 mm long, were located in plant group 2 (Table 1). Many others were recorded on June 18 and June 29, with the frequency peaking on June 29 and decreasing after that until none was present by July 27. Over the May-July period, a total of 11%, 19%, and 15% of marked mistletoe plants in groups 1, 2, and 3, respectively, were used by *M. spinetorum* larvae. The use of mistletoe plants on branches higher in the tree crown is unknown, but Remington (1958) quotes F. G. Hawksworth, who collected *M. spinetorum* larvae in Arizona, as stating that "Of about two dozen larvae taken, not one was found more than 10 feet above ground. However, relatively fewer of the host plants were examined in the higher parts of the pines, and it may be that *M. spinetorum* occasionally occurs much higher than any I found."

TABLE 1. *Mitoura spinetorum* larvae found on dwarf mistletoe at Starkey Experimental Forest in eastern Oregon, 1992.

Plant group	Number of larvae per 100 host plants by inspection date						
	1 June	10 June	18 June	29 June	7 July	15 July	27 July
1	0	0	3	11	3	3	0
2	0	2	4	14	2	4	0
3	0	0	8	4	4	1	0
Total	0	2	15	29	9	8	0

Most marked mistletoe plants hosted only one larvae, but eight of them had two each, one had four, and one had eight. In most cases, feeding damage to the host plant was not severe, except where the plant consisted of only a few aerial shoots or there were multiple larvae feeding on the plant.

Some larvae were collected for laboratory rearing to the adult stage; others were observed *in situ* until they disappeared, presumably to pupate. Comstock and Dammers (1938) and Tilden (1960) reported that pupation takes place in late July in the mass of food plant shoots. We were unable to locate any pupae in the field in spite of careful dissection of more than 30 large mistletoe plants. It may be that mature larvae drop to the ground and pupate in leaf litter under host trees.

From mature larvae brought into the laboratory for observation, two adult males were reared, one on June 30, the other on July 27, 1992. Both specimens are in the Pacific Northwest Research Station collection at Corvallis, Oregon.

From thirty-three other pupae held overwinter, no adults were reared. Parasites, identified as *Aprostocetus* sp. (Eulophidae) (Det. by Steve L. Heydon, Univ. California, Davis), emerged during February 1993 from all of them, usually 20–25 specimens from each pupa.

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